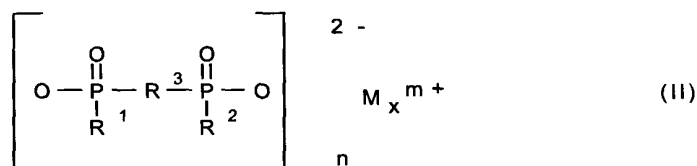
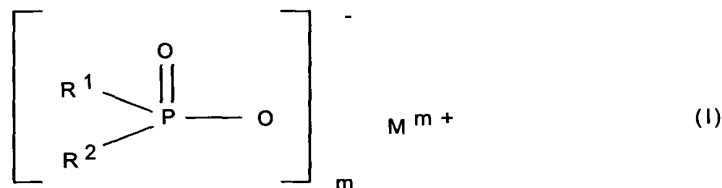


Patent claims

1. A compacted flame-retardant composition comprising an organophosphorus flame-retardant component, prepared by compacting an organophosphorus flame-retardant component with or without a compacting auxiliary.

2. The compacted flame-retardant composition as claimed in claim 1, wherein the organophosphorus flame-retardant component is a phosphinic salt of the formula (I) and/or a diphosphinic salt of the formula (II) and/or polymers of these (component A),



where

R^1 and R^2 are identical or different and are C_1 - C_6 -alkyl, linear or branched, and/or aryl;

R^3 is C_1 - C_{10} -alkylene, linear or branched, C_6 - C_{10} -arylene, -alkylarylene, or -arylalkylene;

M is Mg, Ca, Al, Sb, Sn, Ge, Ti, Zn, Fe, Zr, Ce, Bi, Sr, Mn, Li, Na, K, and/or a protonated nitrogen base;

m is from 1 to 4;

n is from 1 to 4;

x is from 1 to 4.

3. The compacted flame-retardant composition as claimed in claim 1 or 2, wherein M is calcium, aluminum or zinc.

4. The compacted flame-retardant composition as claimed in one or more of claims 1 to 3, wherein R¹ and R² are identical or different and are C₁-C₆-alkyl, linear or branched, and/or phenyl.

5. The compacted flame-retardant composition as claimed in one or more of claims 1 to 4, wherein R¹ and R² are identical or different, and are methyl, ethyl, n-propyl, isopropyl, n-butyl, tert-butyl, n-pentyl, and/or phenyl.

6. The compacted flame-retardant composition as claimed in one or more of claims 1 to 5, wherein R³ is methylene, ethylene, n-propylene, isopropylene, n-butylene, tert-butylene, n-pentylene, n-octylene, or n-dodecylene; phenylene or naphthylene, methylphenylene, ethylphenylene, tert-butylphenylene, methylnaphthylene, ethylnaphthylene, or tert-butylphenylene; phenylmethylene, phenylethylene, phenylpropylene, or phenylbutylene.

7. The compacted flame-retardant composition as claimed in one or more of claims 1 to 6, wherein the composition and/or the organophosphorus flame-retardant component also comprise(s) melamine phosphate, dimelamine phosphate, melamine pyrophosphate, melamine polyphosphates, melam polyphosphates, melem polyphosphates, and/or melon polyphosphates.

8. The compacted flame-retardant composition as claimed in one or more of claims 1 to 7, wherein the composition and/or the organophosphorus flame-retardant component also comprise(s) melamine condensation products, such as melam, melem, and/or melon.

9. The compacted flame-retardant composition as claimed in one or more of claims 1 to 8, wherein the composition and/or the organophosphorus flame-retardant component also comprise(s) oligomeric esters of tris(hydroxyethyl) isocyanurate with aromatic polycarboxylic acids, benzoguanamine, tris(hydroxyethyl) isocyanurate, allantoin, glycoluril, melamine, melamine cyanurate, dicyandiamide, and/or guanidine.

10. The compacted flame-retardant composition as claimed in one or more of claims 1 to 9, wherein the composition and/or the organophosphorus flame-retardant component comprise(s) nitrogen-containing phosphates of the formulae $(\text{NH}_4)_y \text{H}_{3-y} \text{PO}_4$ and, respectively, $(\text{NH}_4 \text{PO}_3)_z$, where y is from 1 to 3 and z is from 1 to 10 000.

11. The compacted flame-retardant composition as claimed in one or more of claims 1 to 9, wherein the composition and/or the organophosphorus flame-retardant component comprise(s), as component B, a synthetic inorganic compound and/or a mineral product.

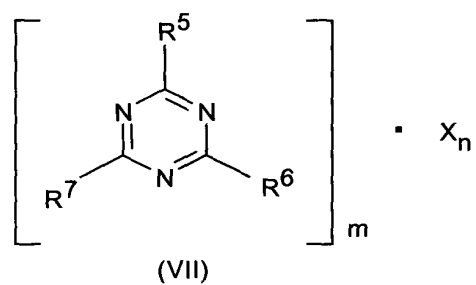
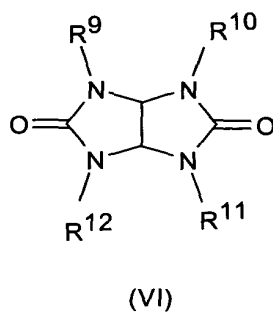
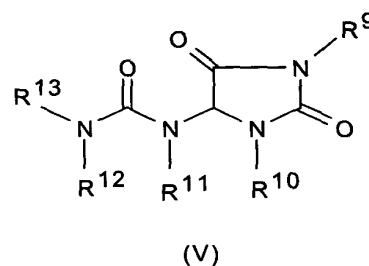
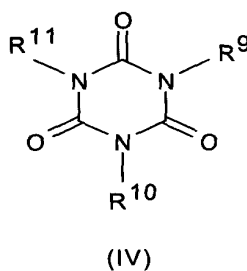
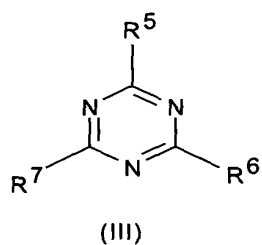
12. The compacted flame-retardant composition as claimed in one or more of claims 1 to 11, wherein component B is an oxygen compound of silicon, is magnesium compounds, is metal carbonates of metals of the second main group of the Periodic Table, is red phosphorus, is zinc compounds, or is aluminum compounds.

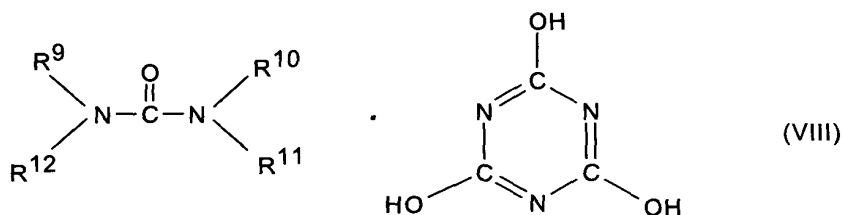
13. The compacted flame-retardant composition as claimed in one or more of claims 1 to 12, wherein the oxygen compounds of silicon are salts and esters of orthosilicic acid and condensation products thereof, are silicates, zeolites, and silicas, are glass powder, glass/ceramic powder, or ceramic powder; the magnesium compounds are magnesium hydroxide, hydrotalcites, magnesium carbonates, or magnesium calcium carbonates; the zinc compounds are zinc oxide, zinc stannate, zinc hydroxystannate, zinc

phosphate, zinc borate, or zinc sulfides; the aluminum compounds are aluminum hydroxide or aluminum phosphate.

14. The compacted flame-retardant composition as claimed in one or more of claims 1 to 13, wherein the composition and/or the organophosphorus flame-retardant component comprise(s) nitrogen compounds as further component C.

15. The compacted flame-retardant composition as claimed in one or more of claims 1 to 14, wherein the nitrogen compounds are those of the formulae (III) to (VIII) or mixtures thereof





where

R^5 to R^7 are hydrogen, C_1 - C_8 -alkyl, or C_5 - C_{16} -cycloalkyl or -alkylcycloalkyl, unsubstituted or substituted with a hydroxy function or with a C_1 - C_4 -hydroxyalkyl function, or are C_2 - C_8 -alkenyl, C_1 - C_8 -alkoxy, -acyl, or -acyloxy, or C_6 - C_{12} -aryl or -arylalkyl, or $-OR^8$ or $-N(R^8)R^9$, or else N-alicyclic systems or N-aromatic systems,

R^8 is hydrogen, C_1 - C_8 -alkyl, C_5 - C_{16} -cycloalkyl or -alkylcycloalkyl, unsubstituted or substituted with a hydroxy function or with a C_1 - C_4 -hydroxyalkyl function, or is C_2 - C_8 -alkenyl, C_1 - C_8 -alkoxy, -acyl, or -acyloxy, or C_6 - C_{12} -aryl or -arylalkyl,

R^9 to R^{13} are the groups of R^8 , or else $-OR^8$,

m and n , independently of one another, are 1, 2, 3, or 4,

X is acids which can form adducts with triazine compounds (III).

16. The compacted flame-retardant composition as claimed in one or more of claims 1 to 15, wherein the composition and/or the organophosphorus flame-retardant component also comprise(s) carbodiimides.

17. The compacted flame-retardant composition as claimed in one or more of claims 1 to 16, which has a median particle size of from 100 to 2000 μm , preferably from 200 to 1000 μm .

18. The compacted flame-retardant composition as claimed in one or more of claims 1 to 17, which has an average bulk density of from 200 to 1500 g/l, preferably from 300 to 1000 g/l.

19. The compacted flame-retardant composition as claimed in one or more of claims 1 to 18, wherein the ratio of amount of compacting auxiliary to organophosphorus flame-retardant component is from 1:199 to 1:0.11, preferably from 1:99 to 1:0.25, and particularly preferably from 1:49 to 1:1.

20. A process for producing compacted flame-retardant composition as claimed in one or more of claims 1 to 19, which comprises compacting the organophosphorus flame-retardant component with or without a compacting auxiliary under a pressure of from 1 to 60 kN/cm².

21. The process for producing compacted flame-retardant composition as claimed in claim 20, which comprises roller compaction.

22. The process as claimed in claim 21, wherein a linear pressure of from 1 to 30 kN/cm is used during the roller compaction.

23. The process as claimed in claim 21 or 22, wherein a linear pressure of from 2 to 20 kN/cm is used during the roller compaction.

24. The process as claimed in one or more of claims 20 to 23, wherein the compacting auxiliary is alkylalkoxylates having from 8 to 22 carbon atoms and from 1 to 80 EO units per mole of alcohol.

25. The process as claimed in one or more of claims 20 to 23, wherein the compacting auxiliary is caprolactam and/or triphenyl phosphate.

26. The process as claimed in one or more of claims 20 to 23, wherein the compacting auxiliary is ethylene glycol, propylene glycol, and/or butylene glycol, their oligomers and/or polymers, and/or their ethers.

27. The process as claimed in one or more of claims 20 to 23, wherein the compacting auxiliary is naturally occurring, chemically modified, and/or synthetic waxes; preferably carnauba waxes and montan waxes.

28. The process as claimed in one or more of claims 20 to 23, wherein the compacting auxiliary is synthetic resins, preferably phenolic resins.

29. A flame-retardant polymer molding composition which comprises a compacted flame-retardant composition as claimed in at least one of claims 1 to 19.

30. The flame-retardant polymer molding composition as claimed in claim 29, which comprises
from 1 to 50% by weight of compacted flame-retardant composition,
from 1 to 99% by weight of thermoplastic polymer or a mixture of the same
from 0 to 60% by weight of additives
from 0 to 60% by weight of filler.

31. The flame-retardant polymer molding composition as claimed in claim 29 or 30, which comprises
from 5 to 30% by weight of compacted flame-retardant composition,
from 5 to 90% by weight of the thermoplastic polymer or a mixture of the same
from 5 to 40% by weight of additives
from 5 to 40% by weight of filler.

32. The flame-retardant polymer molding composition as claimed in one or more of claims 29 to 31, which also comprises components B and/or C.

33. The flame-retardant polymer molding composition as claimed in one or more of claims 29 to 32, wherein the thermoplastic polymers are HI (high-

impact) polystyrene, polyphenylene ethers, polyamides, polyesters, polycarbonates, or blends or polyblends of the type represented by ABS (acrylonitrile-butadiene-styrene), or PC/ABS (polycarbonate/acrylonitrile-butadiene-styrene).

34. The flame-retardant polymer molding composition as claimed in one or more of claims 29 to 33, wherein the thermoplastic polymers are polyamide, polyester, or ABS.

35. A polymer molding, a polymer film, a polymer filament, or a polymer fiber, comprising a compacted flame-retardant composition as claimed in at least one of claims 1 to 19.

36. A polymer molding, a polymer film, a polymer filament, or a polymer fiber as claimed in claim 35, wherein the polymer is a thermoplastic or thermoset polymer.

37. A polymer molding, a polymer film, a polymer filament, or a polymer fiber as claimed in claim 35 or 36, wherein the thermoplastic polymers are HI (high-impact) polystyrene, polyphenylene ethers, polyamides, polyesters, polycarbonates, or blends or polyblends of the type represented by ABS (acrylonitrile-butadiene-styrene), or PC/ABS (polycarbonate/acrylonitrile-butadiene-styrene), polyamide, polyester, and/or ABS.

38. A polymer molding, a polymer film, a polymer filament, or a polymer fiber as claimed in claim 35 or 36, wherein the thermoset polymers are formaldehyde polymers, epoxy polymers, melamine polymers, or phenolic resin polymers, and/or polyurethanes.

39. A polymer molding, a polymer film, a polymer filament, or a polymer fiber as claimed in one or more of claims 35 to 37, which comprises

from 1 to 50% by weight of compacted flame-retardant composition,
from 1 to 99% by weight of thermoplastic polymer or a mixture of the same
from 0 to 60% by weight of additives
from 0 to 60% by weight of filler.

40. A polymer molding, a polymer film, a polymer filament, or a polymer fiber as claimed in one or more of claims 35 to 39, which comprises
from 5 to 30% by weight of compacted flame-retardant composition,
from 5 to 90% by weight of thermoplastic polymer or a mixture of the same
from 5 to 40% by weight of additives
from 5 to 40% by weight of filler.